Math 111.01 Summer 2003
Assignment #3

This assignment is due at the beginning of class on **Friday, July 11, 2003**. You are encouraged to form study groups and collaborate with others on this assignment. However, the final work you submit must be your own. You must submit all problems that are marked with an asterix (*). YOUR ASSIGNMENT MUST BE STAPLED AND PROBLEM NUMBERS CLEARLY LABELLED. UNSTAPLED ASSIGNMENTS WILL NOT BE ACCEPTED!

1. Rework all the problems on Prelim #1, paying special attention to those that you got incorrect (even partially).

2. Practice problems.

- Section 2.8 #5, 31, 35, 45, 47
- Section 2.10 #5, 9, 11, 13, 15, 21
- Section 3.1 #9, 21, 31, 41, 47, 51, 59
- Section 3.2 #5, 17, 19, 21, 29, 39
- Section 1.7 #5, 11, 17
- Section 3.4 #3, 13, 23, 29

3. Practice computing derivatives.

- Section 3.1 #3, 5, 7, 11, 13, 15, 17, 19
- Section 3.2 #3, 7, 9, 11, 13, 15, 35

4. * Problems to hand in.

- Section 2.8 #12, 32, 46
- Section 2.10 #4, 18, 22
- Section 3.1 #8, 20, 34, 42, 46
- Section 3.2 #4, 10, 28, 36
- Section 1.7 #4, 10, 18
- Section 3.4 #8, 14, 18, 26

5. * More practice computing derivatives.

- Section 2.8 #20, 22, 23, 24
- Page 259 #3, 6, 9
- Section 3.4 #4, 9, 11

6. * Consider the function $f(x)$ defined by

$$f(x) = \begin{cases} x^2 \left| \cos \dfrac{\pi}{2x} \right| & \text{if } x \neq 0, \\ 0 & \text{if } x = 0. \end{cases}$$

(a) Show that $f'(0)$ exists and find its value.

(a) Show that $f'(1/3)$ does not exist.

7. * Use your calculators to guess the value of $\lim\limits_{x \to 0} (\sec x)^{1/x^2}$.